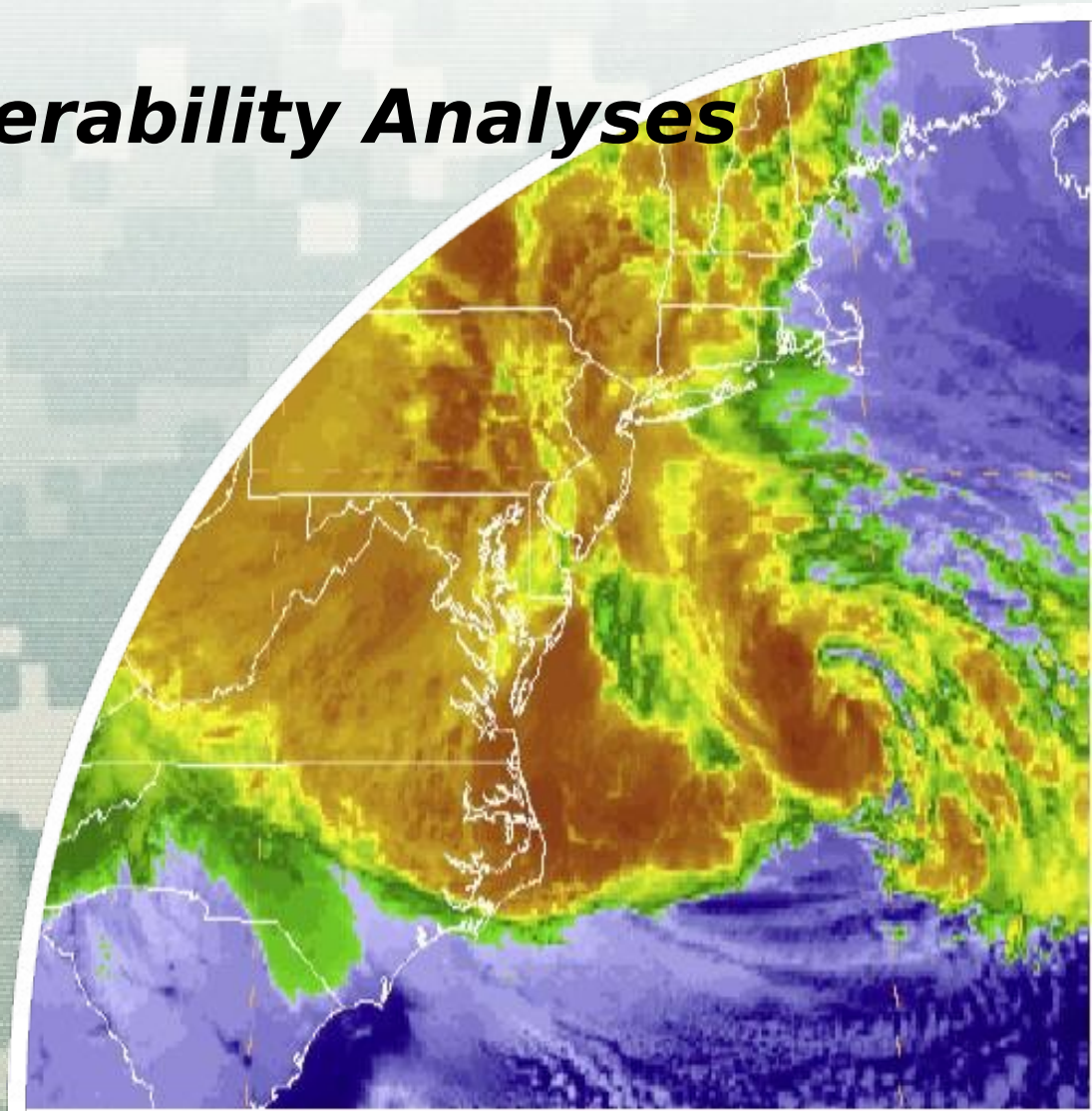
North Atlantic Coast Comprehensive Study

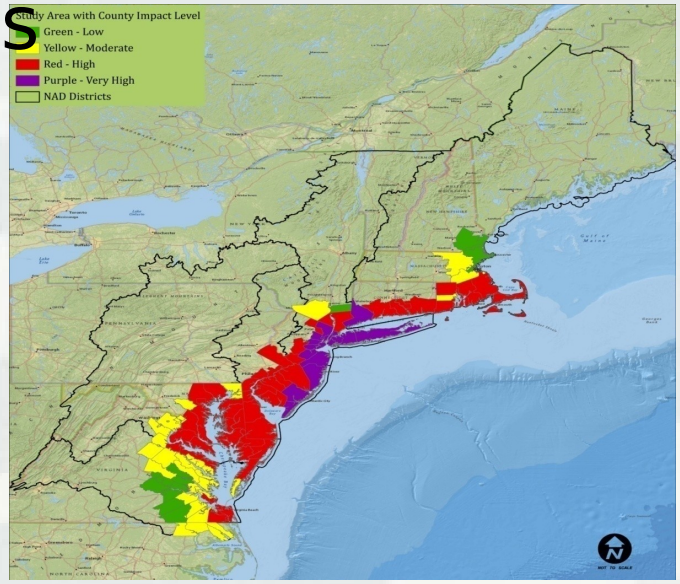
Application of Vulnerability Analyses



U.S. Army Corps of Engineers
Coastal Storm Risk Management
Planning Center of Expertise
25 September 2013

Context

- **Coastal Framework**
  - Regional scale
  - Opportunities by reach/state
  - Identify range of potential solutions/measures reach/state
  - State Narrative Appendices
  - Plan Formulation

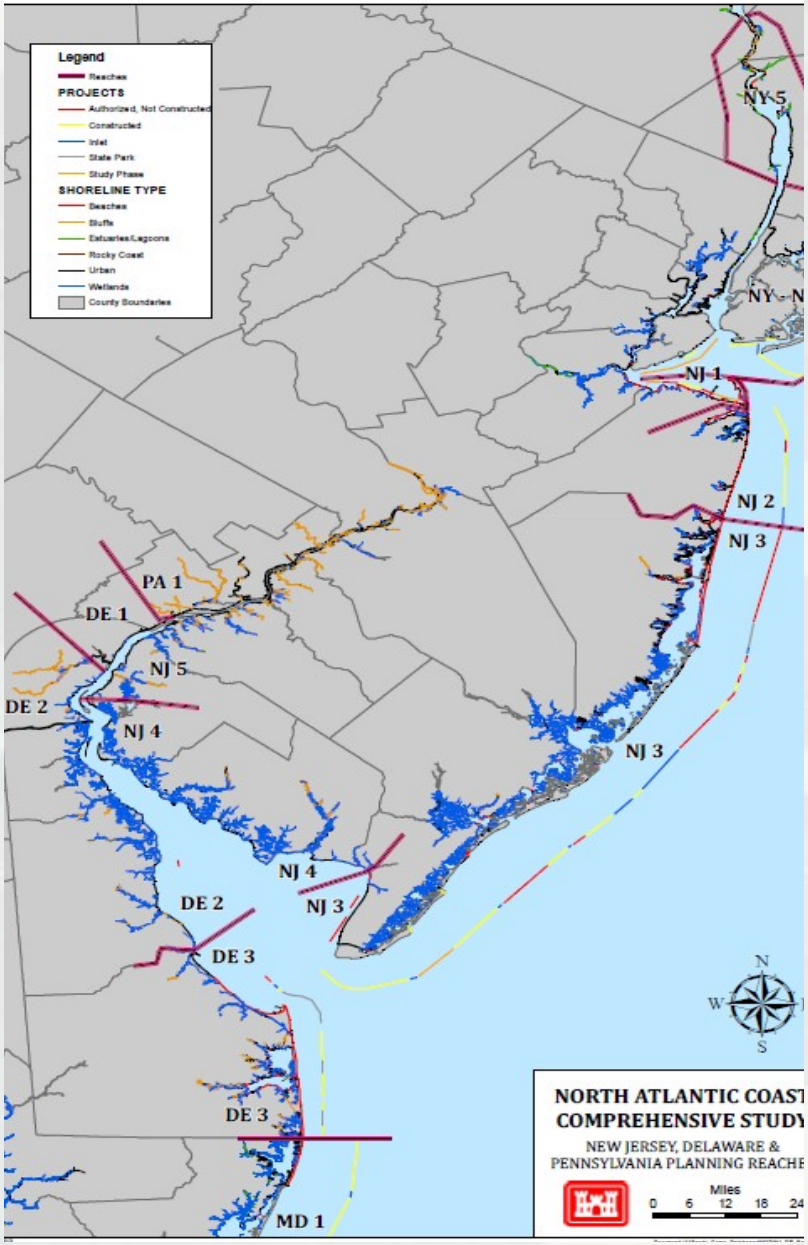


Plan Formulation

- Existing/future conditions and projects
- Sea level rise and inundation mapping
- Planning reaches
- Existing and ongoing plans by others
- Risk exposure assessment/mapping
  - Identify areas of high exposure
- Strategies/opportunities to manage risk
- Range of appropriate risk reduction measures

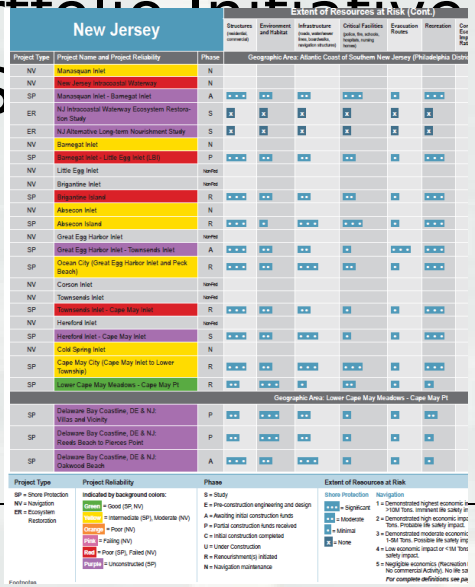
Study Area - Reaches

- 38 Reaches defined by:
  - Physiographic/geographic characteristics (shoreline type)
  - USACE and other shore protection projects
  - Land use
  - Jurisdictions



USACE Project Map

- Existing USACE projects
- Considered in the Without Project Condition
- From PL 113-2 Interim 1 and 2 Reports and The Coastal Systems Portfolio Initiative (CS



New Jersey

Extent of Resources at Risk (Cont.)

Project Type	Project Name and Project Reliability	Phase	Structures (residential, commercial)	Environment and Habitat	Infrastructure (roads, waterwater lines, boat docks, navigation structures)	Critical Facilities (police, fire, schools, hospitals, nursing homes)	Evacuation Routes	Recreation	Cultural Resources
	Geographic Area: Atlantic Coast of Southern New Jersey (Philadelphia District)								
NV	Manasquan Inlet	N							
NV	New Jersey Intracoastal Waterway	N							
SP	Manasquan Inlet - Barnegat Inlet	A	▪▪▪	▪▪	▪▪	▪▪▪	▪	▪▪▪	
ER	NJ Intracoastal Waterway Ecosystem Restoration Study	S	▪	▪	▪	▪	▪	▪	
ER	NJ Alternative Long-term Nourishment Study	S	▪	▪	▪	▪	▪	▪	
NV	Barnegat Inlet	N							
SP	Barnegat Inlet - Little Egg Inlet (LBI)	P	▪▪▪	▪▪	▪▪	▪▪	▪	▪▪▪	
NV	Little Egg Inlet	Non-Fed							
NV	Brigantine Inlet	Non-Fed							
SP	Brigantine Island	R	▪▪▪	▪▪	▪▪	▪▪	▪	▪▪▪	
NV	Absecon Inlet	N							
SP	Absecon Island	R	▪▪▪	▪	▪▪▪	▪▪▪	▪	▪▪▪	
NV	Great Egg Harbor Inlet	Non-Fed							
SP	Great Egg Harbor Inlet - Townsends Inlet	A	▪▪▪	▪▪	▪▪	▪	▪▪▪	▪▪▪	
SP	Ocean City (Great Egg Harbor Inlet and Peck Beach)	R	▪▪▪	▪▪	▪▪▪	▪▪	▪	▪▪▪	
NV	Corson Inlet	Non-Fed							
NV	Townsends Inlet	Non-Fed							
SP	Townsends Inlet - Cape May Inlet	R	▪▪▪	▪▪	▪▪	▪	▪	▪▪▪	
NV	Hereford Inlet	Non-Fed							
SP	Hereford Inlet - Cape May Inlet	S	▪▪▪	▪▪	▪▪▪	▪	▪	▪▪▪	
NV	Cold Spring Inlet	N							
SP	Cape May City (Cape May Inlet to Lower Township)	R	▪▪▪	▪▪	▪▪▪	▪▪▪	▪	▪▪▪	
SP	Lower Cape May Meadows - Cape May Pt	R	▪▪▪	▪▪▪	▪	▪▪	▪	▪	
	Geographic Area: Lower Cape May Meadows - Cape May Pt								
SP	Delaware Bay Coastline, DE & NJ: Villas and Vicinity	P	▪▪	▪▪▪	▪▪	▪	▪	▪▪	
SP	Delaware Bay Coastline, DE & NJ: Reeds Beach to Pierces Point	P	▪▪	▪▪▪	▪▪	▪	▪	▪	
SP	Delaware Bay Coastline, DE & NJ: Oakwood Beach	A	▪▪▪	▪▪	▪▪▪	▪	▪	▪	

Project Type: SP = Shore Protection; NV = Navigation; ER = Ecosystem Restoration

Project Reliability: indicated by background colors: Green = Good (SP, NV); Yellow = Intermediate (SP), Moderate (NV); Orange = Poor (NV); Pink = Failing (NV); Red = Poor (SP), Failed (NV); Purple = Unconstructed (SP)

Phase: S = Study; E = Pre-construction engineering and design; A = Awaiting initial construction funds; P = Partial construction funds received; C = Initial construction completed; U = Under Construction; R = Renourishment(s) initiated; N = Navigation maintenance

Extent of Resources at Risk: ▪▪▪ = Significant; ▪▪ = Moderate; ▪ = Minimal; ▪ = None

Shore Protection: 1 = Demonstrated highest economic benefits >10M Tons, imminent life safety impact; 2 = Demonstrated high economic benefits 5-10M Tons, Possible life safety impact; 3 = Demonstrated moderate economic benefits 1-5M Tons, Possible life safety impact; 4 = Low economic impact or <1M Tons, No life safety impact; 5 = Negligible economics (Recreation only, No commercial Activity), No life safety impact

Navigation: For complete definitions see pa

NJ State Project Map

- Existing State projects
- Considered in the Without Project Condition
- Integrate other agency strategies/regional plans
  - PlaNYC report
  - Joint Field Offices State Recovery Support Strategies
  - Hurricane Sandy Rebuilding Task Force

Exposure Assessment

***Composite Exposure Index**

***Infrastructure + Population**

***Social**

-2010 Census (tract level)

-% Population 65 and over

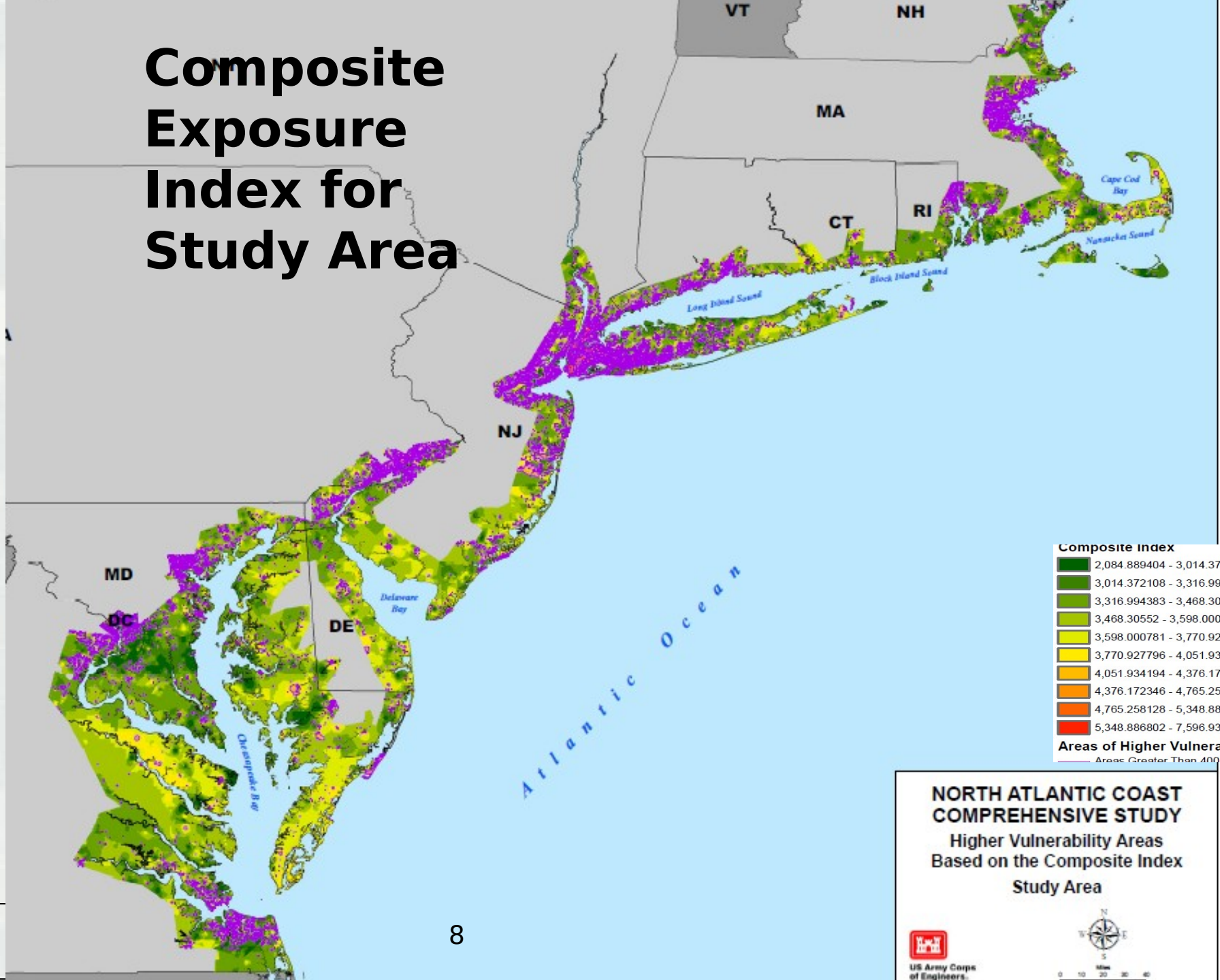
-% Population under 5

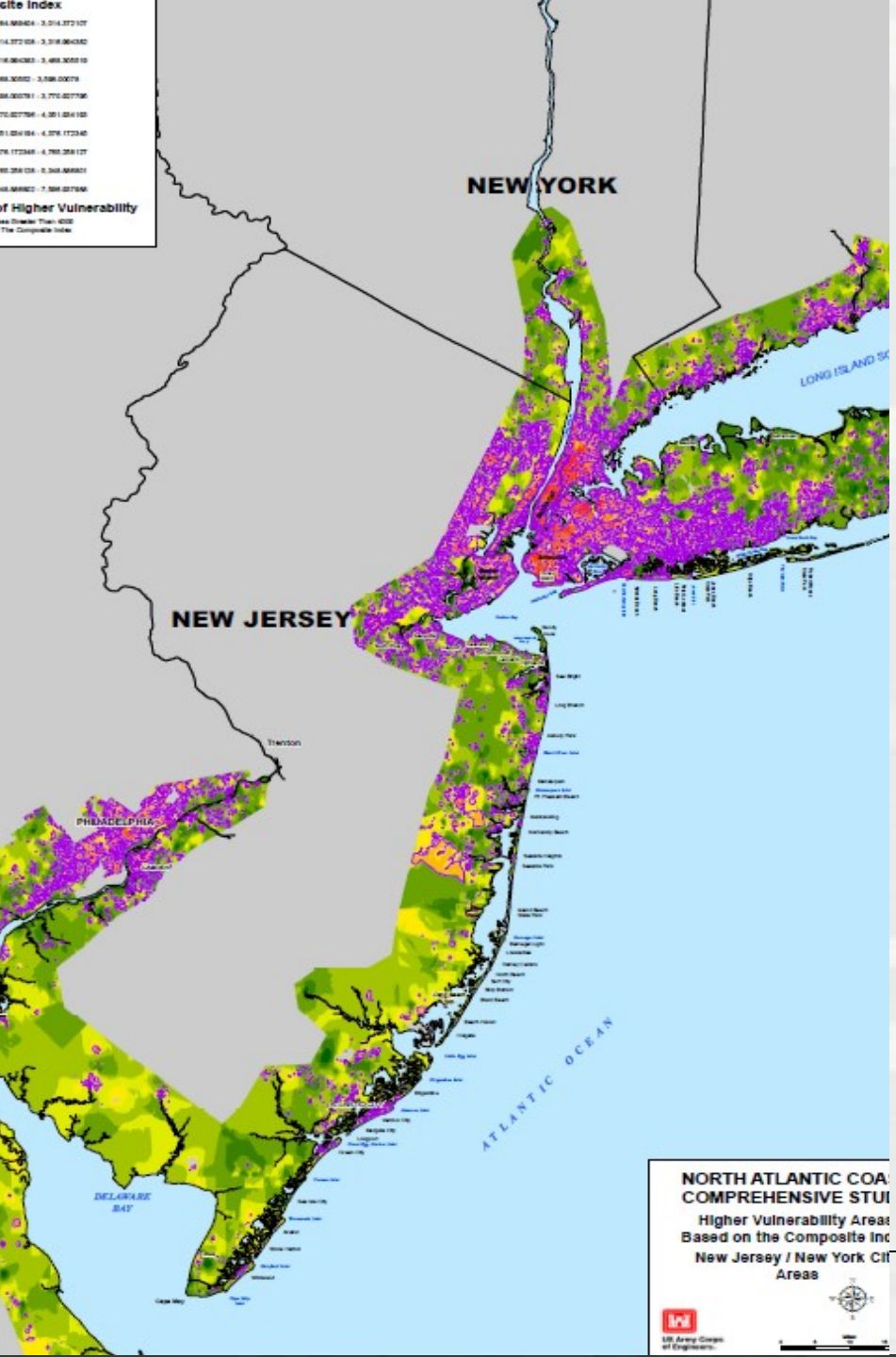
-% Population w/income below poverty

-% Population non-proficient English speakers

-Index of income inequality

Composite Exposure Index for Study Area





Composite Exposure Index : State of New Jersey

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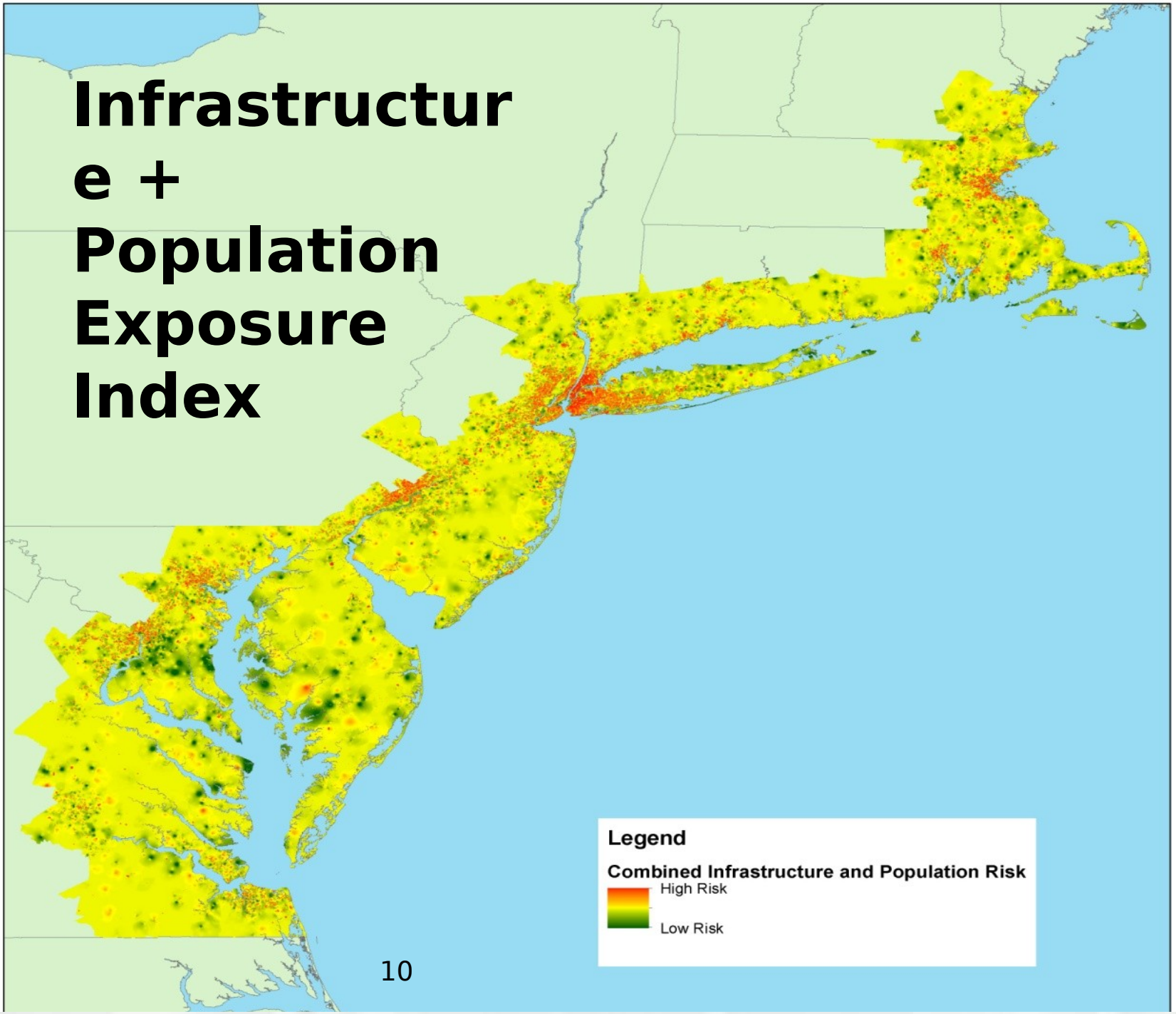
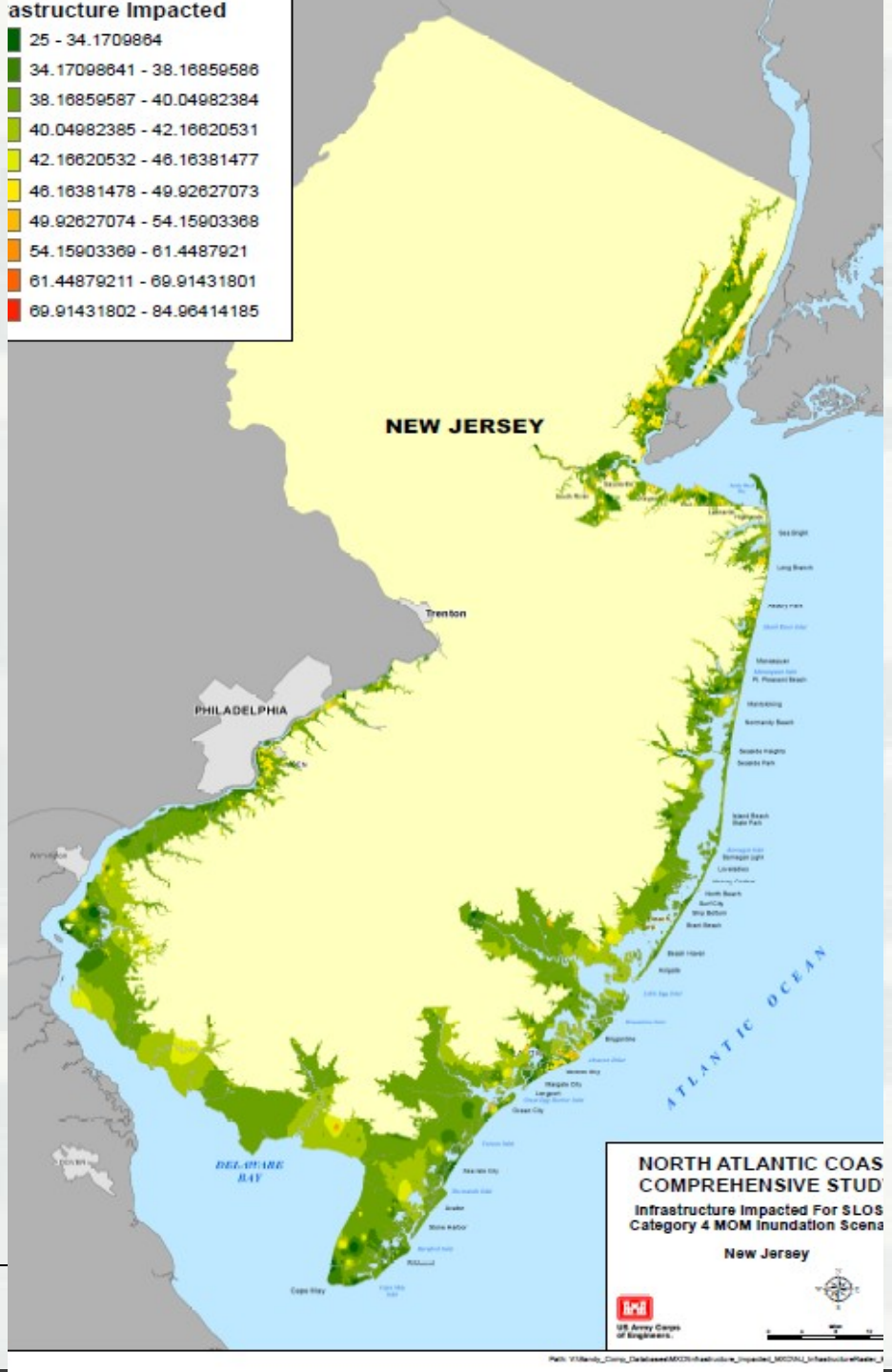
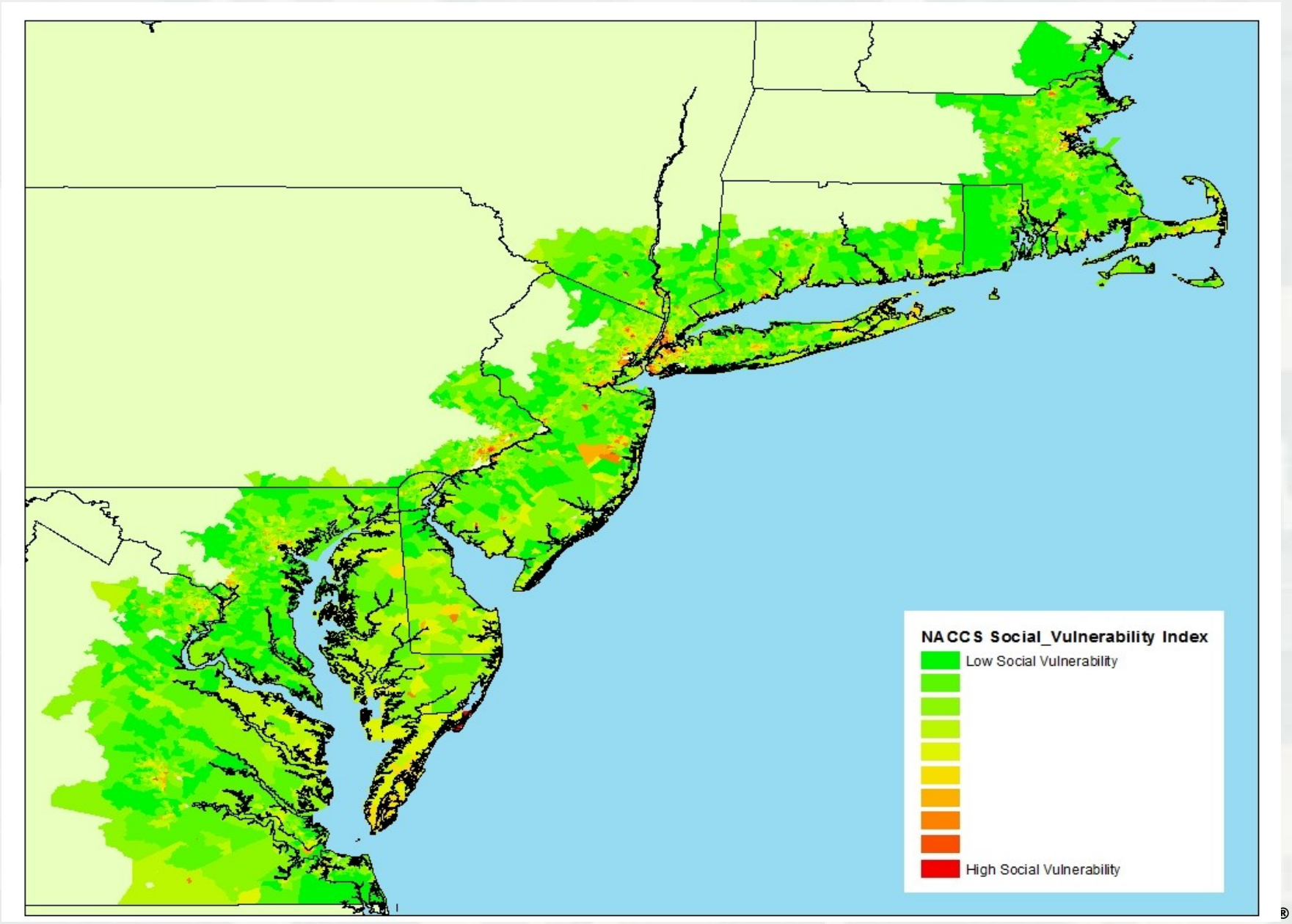
Infrastructure + Population Exposure Index



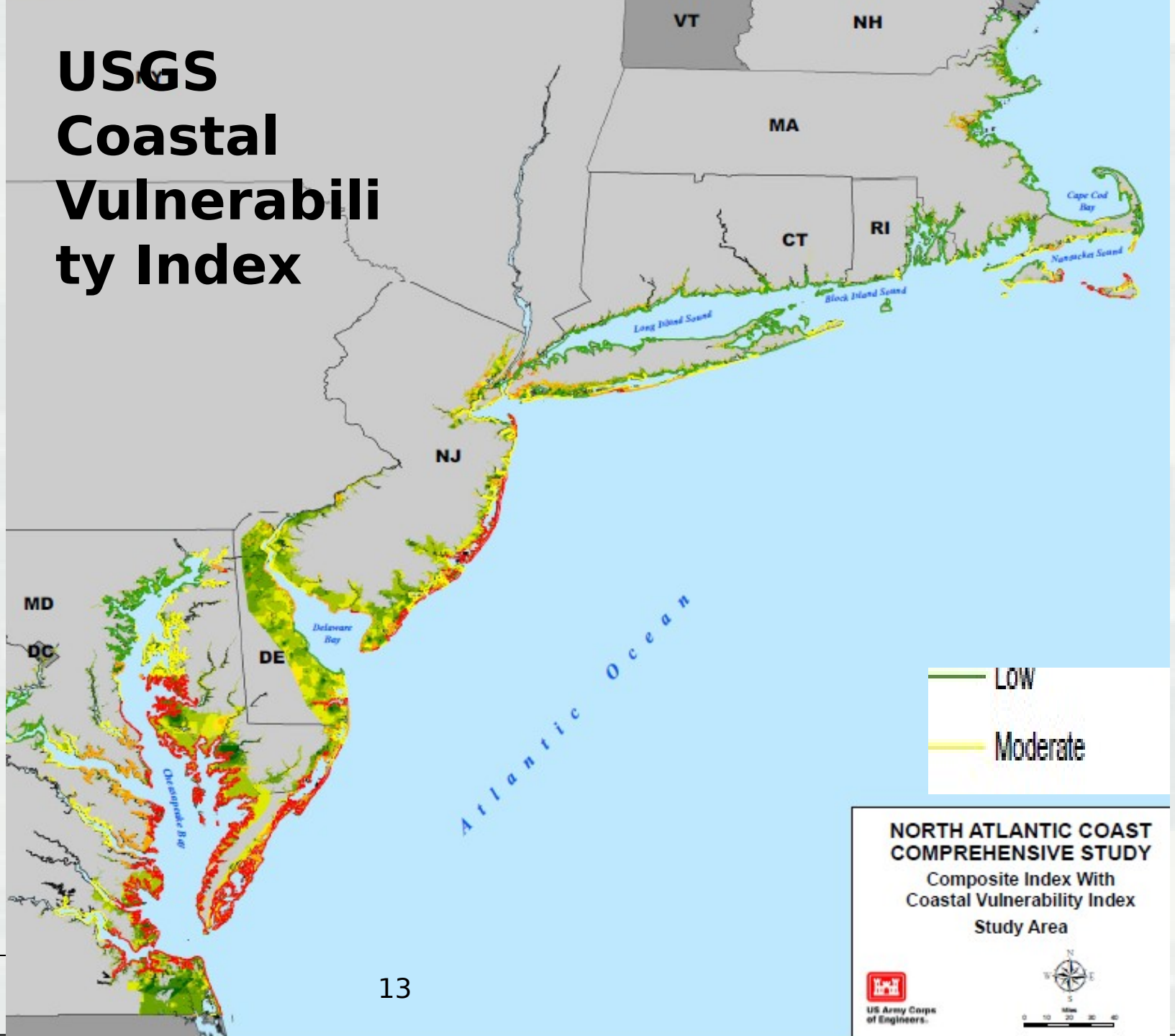
Infrastructure and Population Exposure Index : State of New Jersey



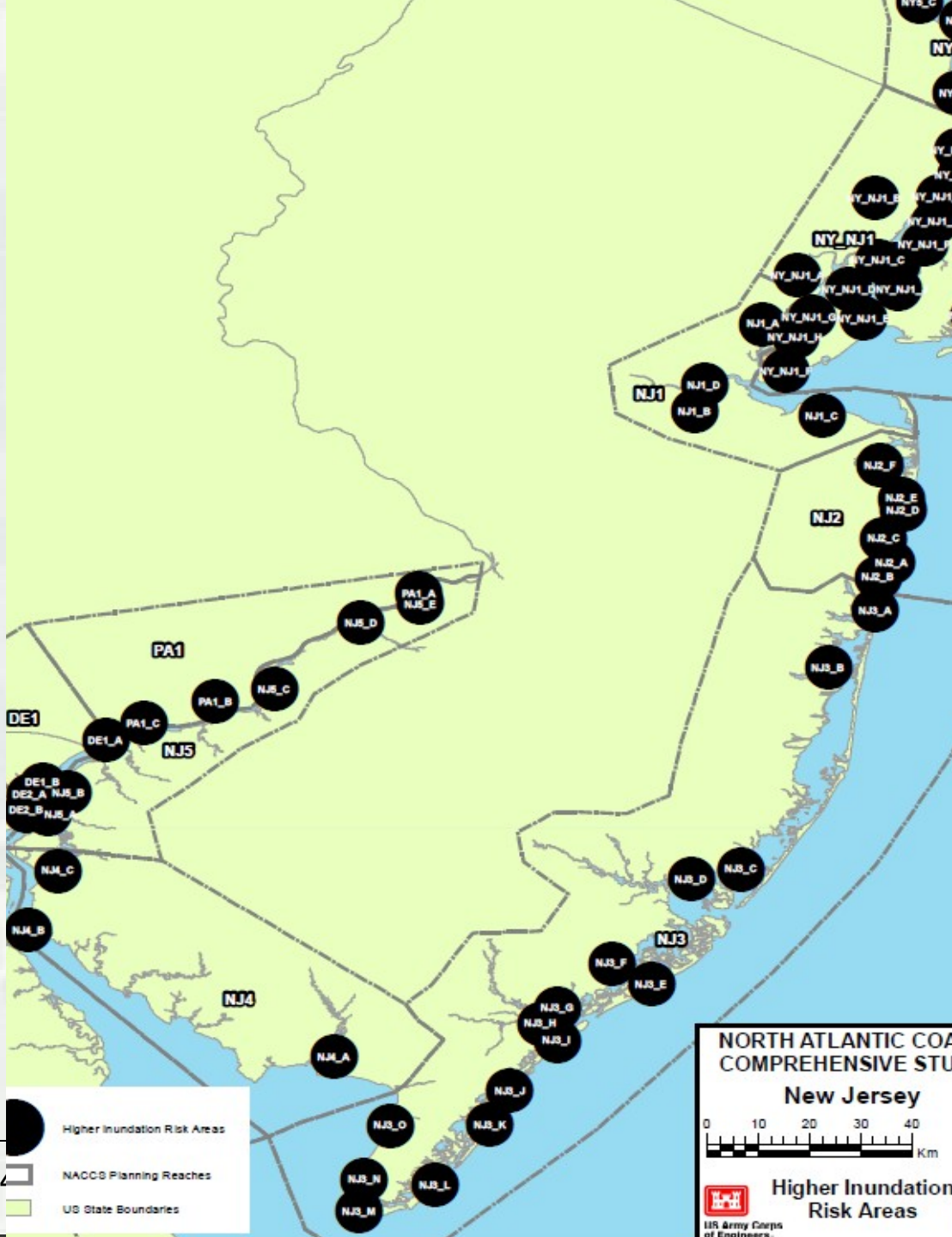
Social Vulnerability Index



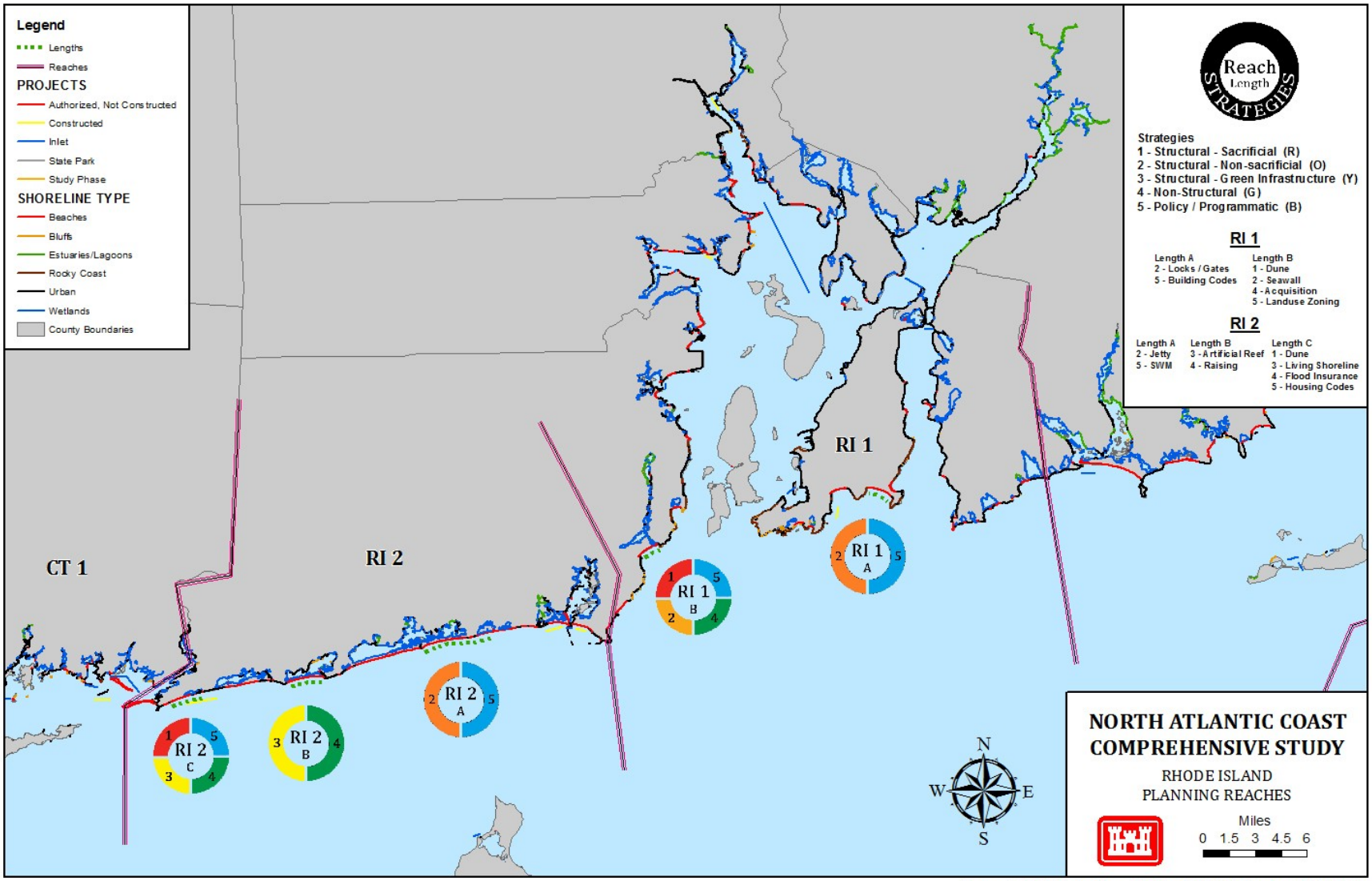
USGS Coastal Vulnerability Index



Problem Area Identification: State of New Jersey



Risk Reduction Framework Example Map



Questions/Discussion